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CHARLES DARWIN UNIVERSITY

Family Name	
Given Names	
Student Number	
Teaching Period	Semester 1, 2017

FINAL EXAMINATION	**DURATION**
HIT337 – Distributed Development	Reading Time: **10** minutes Writing Time: **180** minutes

INSTRUCTIONS TO CANDIDATES

A4 Sheet of Notes must be hand-written and submitted with final exam paper.

The examination has one section. All questions must be answered on the Answer Booklet provided. Please ensure that your name and student number are clearly indicated on your Answer Sheet and at the top of this examination paper.

- Note that questions ARE NOT of equal value.
- Read ALL questions carefully.
- Total marks – 40 marks.

EXAM CONDITIONS

You may begin writing from the commencement of the examination session. The reading time indicated above is provided as a guide only.

This is a RESTRICTED OPEN BOOK examination

No calculators are permitted

One A4 sheet of handwritten double-sided notes permitted

Hard copy, unannotated English translation dictionary only

ADDITIONAL AUTHORISED MATERIALS	EXAMINATION MATERIALS TO BE SUPPLIED
No additional printed material is permitted	1 x 16 Page Book

THIS EXAMINATION PAPER AND SUPPLIED MATERIALS ARE NOT PERMITTED TO BE REMOVED FROM ANY EXAMINATION VENUE IN ANY CIRCUMSTANCE. THIS EXAMINATION IS PRINTED DOUBLE-SIDED.

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Question 1

a. Describe the 3 tier architecture. Describe what functionality goes in each tier. Remember the client (eg. the browser) is considered a separate fourth tier and should not be included.

(3 Marks)

b. Describe the technologies used this semester to represent each of the tiers.

(3 Marks)

Question 2

Describe the Servlet lifecycle.

(3 Marks)

Question 3

Describe the parts of an HTTP request. Describe the 2 main methods you can override to serve a request in a class extending HttpServlet. How do they differ?

(3 Marks)

Question 4

Explain why you would put calls to a database using transaction methods with examples.

(4 Marks)

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Question 5

You have a table which was created with the following code:

```
create table employee
(
  id number,
  username varchar(30),
  status varchar(30)
);
```

Assume that you can connect to the database with getConnection() which returns an instance of Connection:

a. Write some code using a servlet that reads variables from a post request and inserts them into the database.

(5 Marks)

b. Write another piece of code using a servlet that prints out all of the data in the table using a PrintWriter as a HTML table.

(5 Marks)

c. Write the relevant parts of the web.xml to handle requests to these servlets.

(5 Marks)

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Question 6

Take in two parameters, one called “key” and another called “message”:

```
http://localhost/my_webapp/my_servlet?key=alpha&message=Hello_There
```

Provide a JSP page that will do the following:

The JSP should: Get the value of a **session** attribute with the same name as the value of the key request parameter. The value of this attribute will be an Integer.

If this integer is greater than 0 then it should:

- Output the value of the message parameter in <h1> tags that many times.

If the integer is less than or equal to 0 it should:

- Output the following message: “No message was output”.

(5 marks)

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Question 7

Given the following servlet:

```
public class MyServlet extends HttpServlet

{

  private PrintWriter out;

  public void doGet(HttpServletRequest request,
  HttpServletResponse response) throws IOException,
  ServletException

  {

   out = response.getWriter();

   String name = request.getParameter("name");

   out.write("<html><head></head><body>");
   outputMessages(name);
   out.write("</body></html>");

  }

  private void outputMessages(String name)

  {

    for(int i = 0; i < 10; i++)

    {

      out.write("A message for " + name + "<br />");

    }

  }

}
```

Explain what is wrong with this servlet. Describe what problems could occur when it is used.

Hint: Consider thread/concurrency issues.

(4 Marks)

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